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ABSTRACT

This course guide for a construction drafting course is one of four developed for the graphic communications area in the North Dakota senior high industrial arts education program. (Eight other guides are available for two other areas of Industrial Arts--energy/power and production.) Part 1 provides such introductory information as a definition and instructional objectives for Industrial Arts. Part 2 contains the course rationale and objectives; guidelines for implementation; taxonometric structure; course description including length, credit, prerequisites, and student competencies; suggested instructional units with required number of class periods; and 11 units. Each unit includes some or all of the following material: unit objective(s), topic outline, and selected student competencies to be developed through sample coordinated learning activities. Unit titles are Introduction to Construction Drafting, Review of Drafting Procedures, Building Codes and Office Practices Used, Plot or Site Plans, Floor Plans and Utility Planning, Foundation Plans, Elevations, Construction Sections, Construction Details, Presentation Drawings, and Career Opportunities in Construction Drawing. A reference list is appended. (YLB)

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NORTH DAKOTA SENIOR HIGH
INDUSTRIAL ARTS
CURRICULUM GUIDES

CONSTRUCTION DRAFTING

(GRAPHIC COMMUNICATIONS)

INDUSTRIAL ARTS
SENIOR HIGH--LEVEL II

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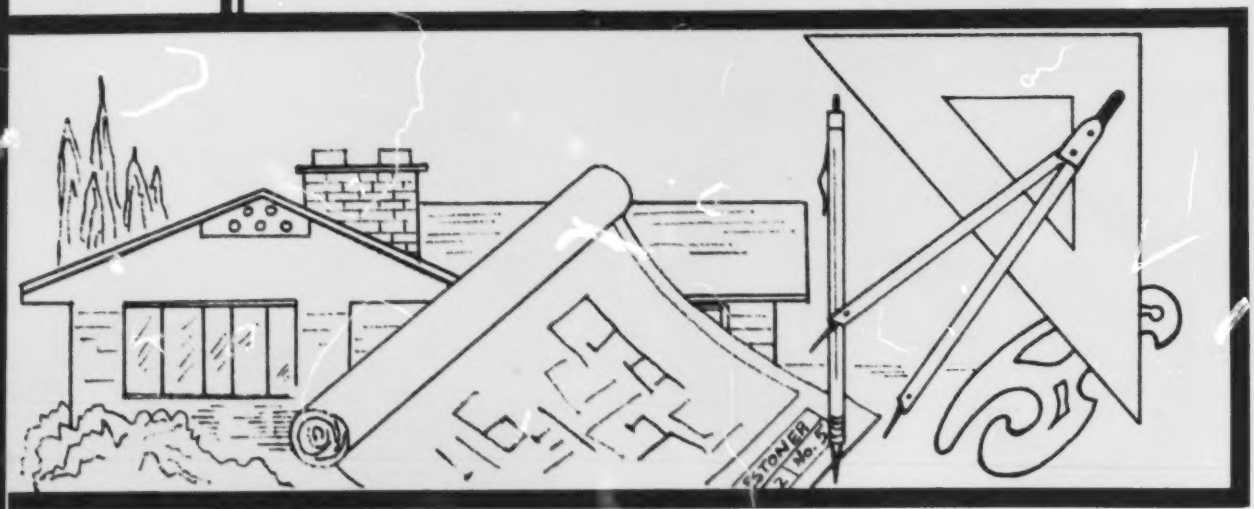

NORTH DAKOTA

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NORTH DAKOTA STATE BOARD FOR
VOCATIONAL EDUCATION
Bismarck, North Dakota

NORTH DAKOTA SENIOR HIGH INDUSTRIAL ARTS CURRICULUM GUIDES

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Supported by
The North Dakota State Board For Vocational Education
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PREFACE

One of the biggest challenges facing education today is keeping the instructional content current. Industrial Arts in particular must be quick to respond to changes in our technological society. For many years, North Dakota has offered quality industrial arts programs to students in the public schools. Credit for this is due to the teachers who have shown the desire to continually improve programs, keep their content current, and make instruction relevant.

The Industrial Arts curriculum has boundless potential for courses and program development. However, this program possibility excites the imagination of teachers to offer endless number of courses which causes a need to determine what is of greatest value for students to experience.

Thus, the development of an appropriate or model curriculum requires a critical examination of several undergirding questions: What is the overall responsibility of Industrial Arts? What Industrial Arts goals are appropriate for the different grades or school levels? What courses constitute a meaningful curriculum for these goals to be realized? What shall be the scope and sequence of the total curriculum? The answers to these questions have been addressed by a North Dakota Industrial Arts Master Plan curriculum committee and are recorded in the North Dakota Senior High Industrial Arts Program of Studies booklet.

The Program of Studies describes the complete secondary school industrial arts education. The Program of Studies Booklet emphasizes the Level II Senior High programs with specific courses, course descriptions, objectives and units of instruction. The Junior High-Level I program is dealt with in a general basis for the purpose of articulating the two levels within the total secondary school industrial arts program.

Three types of Industrial Arts programs are included in the Program of Studies along with the individual courses which constitute the complete secondary school curriculum:

1. ORIENTATION AND EXPLORATION-- Level I program designed for grades seven through nine. The purpose of this program is to provide students with first-hand exploratory experiences in the four technical cluster areas. The learning experiences should provide an awareness of the impact of industry and it's associated technologies on the lives of individuals. Furthermore, this program assists individuals in making informed and meaningful occupational/career choices.
2. PERSONAL ENRICHMENT-- The program designed to prepare students with a general education of technolgical literacy, avocational skills and consumer information. This is purely an elective program of students for students who desire to gain an understanding of the technical concepts for personal satisfaction.
3. PRE-TECHNICAL-- This program provides concentrated and specialized technical courses for grades ten through twelve. These courses are articulated with the Level I technical cluster areas. Students at this level have a wide range of interests, abilities, and life aspirations. Therefore, the key element for the senior high pre-technical program is flexibility to meet the varied needs of learners. The program is designed to prepare students for advanced educational or training programs.

The North Dakota Senior High Program of Studies identified twelve different courses recommended to be offered in grades ten, eleven and twelve. The model curriculum lists four courses for each of three technical areas: (1) Energy/power,(2) Graphic Communications, and (3) Production. Individual course guides have been developed for each of the twelve courses recommended for the senior high curriculum. This being one of the twelve course guides. Similar guides have been developed for the remaining eleven.

Each course guide contains the course rationale, objectives,content, units and selected student competencies to be developed along with student learning activities. The primary aim of the course guides is to provide meaningful direction and still leave opportunity for individual teacher creative approaches in meeting the diverse needs of unique school populations. The course guides not only proposes to assist teachers and administrators in keeping their programs up-to-date, but also to promote industrial arts education program uniformity among North Dakota schools.

Ernest Breznay

Ernest Breznay
State Industrial Arts Supervisor
North Dakota State Board for Vocational Education
July, 1981

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The North Dakota Industrial Arts profession is indebted to the following individuals who gave their time and talents in the development of the Twelve Senior High Industrial Arts course guides. These teachers and teacher educators attended an Organizational meeting, participated in a curriculum writing seminar, and developed individual course guides during 1980 & 1981.

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BASIC BELIEFS ABOUT INDUSTRIAL ARTS

INDUSTRIAL ARTS IS .....

- an educational discipline founded upon the knowledge base of technology - the means by which material things are produced.
- an instructional program affording boundless opportunities for learning how technology has been, is now and will be basic to human desires and needs.
- a fundamental educational program that can serve educational priorities, whether they are academic education, general education, vocational education, career education, ad. inf.
- an activity based curriculum enabling students to learn through doing.
- logically a discipline with a curriculum continuum from grade K through 12.

INDUSTRIAL ARTS IS JUSTIFIED BECAUSE .....

- all persons need to know about the technological environment, the material culture, and industry because they are economically, socially and emotionally affected by them.
- all persons must make a career choice from an extremely large and increasing number of occupations that are affected by technology; therefore, they should have opportunities to develop interests, uncover talents, explore technical and applied science fields and study occupations.
- all persons must select, buy, use, and maintain the products of industry -- houses, automobiles, appliances, clothes furniture and items of a never ending list. A knowledge of products, their manufacture, characteristics, advantages and disadvantages makes for intelligent consumption.
- all persons need recreational, leisure time and avocational outlets.
- all persons need to have opportunities to develop planning, creative, problem solving and technical skills in harmony with their inherent desire to seek the better way.

INDUSTRIAL ARTS CAN HELP THE STUDENT TO .....

- gain an understanding of industry and technology.
- discover interests and talents.
- develop techniques in problem solving.
- develop basic skills in the safe use of tools and machines.
- make informed and meaningful occupational choices.
- acquire interests in avocational pursuits and hobbies.
- develop safe working habits.
- apply other school subjects.
- become a wiser consumer.
- develop creativity.
- develop pride in work well done.
- work cooperatively with others.

THE INDUSTRIAL ARTS MISSION

The mission of Industrial Arts Education is to assist the student in developing an understanding about industry and technology and in the discovery and development of individual potential.

GOALS

Consistent with their abilities, interests and educational needs:

1. Industrial Arts students at the middle or junior high school level will be aware of employment and/or self-employment opportunities and requirements for use in making career choices and in determining their educational programs.
2. Industrial Arts students at the senior high school level will acquire technical competencies in preparation for advanced vocational or technical education programs.
3. Industrial Arts students at the senior high school level will acquire competencies that lead to responsible citizenship through technological understanding, consumer knowledge and the productive use of leisure time.

INDUSTRIAL ARTS: AN OFFICIAL DEFINITION

Industrial Arts education programs means those education programs which pertain to the body of related subject matter, or related courses, organized for the development of understanding about the technical, consumer, occupational, recreational, organizational, managerial, social, historical, and cultural aspects of industry and technology including learning experiences involving activities such as experimenting, designing, constructing, evaluating, and using tools, machines, materials, and processes which provide opportunities for creativity and problem solving or assist individuals in the making of informed and meaningful occupational choices or which prepare them for [illegible] advanced trade and industrial or technical education programs.

INDUSTRIAL ARTS INSTRUCTIONAL OBJECTIVES

Industrial Arts students at the Senior High School Level will acquire competencies that lead to responsible citizenship through technological understanding, consumer knowledge and the productive use of leisure time. The program stresses the following instructional objectives:

1. Develop an insight and understanding of industry and technology, its place in our society and the free enterprise system.
2. Discover and develop individual talents, aptitudes, interests, and potentials as related to industry and technology.
3. Develop an understanding of industrial processes and the practical application of scientific principles.
4. Develop technical problem-solving and creative abilities involving the use of materials, processes, and products of industry and technology.
5. Develop an understanding of industrial and technological career opportunities and their requirements and develop those traits which will help students obtain and maintain employment.

As determined by Title II of PL No. 94-482, the Vocational Education Act of 1976 and the State Board for Vocational Education, the purpose of funding industrial arts programs with vocational monies will be to:

1. Assist individuals in the making of informed and meaningful occupational and educational choices.
2. Prepare individuals for enrollment in advanced or highly skilled vocational and technical programs.

NORTH DAKOTA INDUSTRIAL ARTS CURRICULUM

Program Scope and Sequence Model

ELEMENTARY LEVEL
(k-6)
Awareness

At the elementary level, learning experiences in industrial arts will be directed primarily toward the child's development of an awareness of industry/technology and the world of work. The concepts and activities will be integrated with the elementary curriculum to enrich and reinforce the common learning areas.

JUNIOR HIGH LEVEL I
(7-9)
Orientation and Exploration

INSIGHTS INTO INDUSTRY & TECHNOLOGY

A broad overview of industry and technology. Learning experiences will be directed toward the student's exploration of the historical, present, and future potentials of industry and technology.

SENIOR HIGH LEVEL II
(10-12)
Personal Enrichment
Pre-Technical

- GRAPHIC COMMUNICATIONS TECHNOLOGY
- MANUFACTURING TECHNOLOGY
- CONSTRUCTION TECHNOLOGY
- ENERGY/POWER TECHNOLOGY

DESIGN/DRAFTING
PHOTOGRAPHY
GRAPHIC ARTS
CONSTRUCTION DRAFTING
INDIVIDUAL TECHNICAL PROBLEMS

PRODUCTION

WOOD TECHNOLOGY
PLASTIC TECHNOLOGY
METAL TECHNOLOGY
INDUSTRIAL CRAFTS
INDIVIDUAL TECHNICAL PROBLEMS

ENERGY SOURCES
POWER TECHNOLOGY
ELECTRICAL / ELECTRONIC TECHNOLOGY
TRANSPORTATION TECHNOLOGY
INDIVIDUAL TECHNICAL PROBLEMS

THE INDUSTRIAL ARTS PROGRAM OF STUDIES

LEVEL	GOAL	PROGRAM
II HIGH SCHOOL (Grades 10, 11, & 12)	1. Personal Enrichment 2. Pre-Technical	**GRAPHIC COMMUNICATIONS TECHNOLOGY** •Design/Drafting •Photography •Graphic Arts •Construction Drafting •Industrial Technical Problems **ENERGY/POWER TECHNOLOGY** •Energy Sources •Power Technology •Electrical/Electronic Technology •Transportation Technology •Individual Technical Problems **PRODUCTION TECHNOLOGY** •Wood Technology •Metal Technology •Plastic Technology •Industrial Crafts •Individual Technical Problems **INDIVIDUAL TECHNICAL PROBLEMS** (Multiple Offerings)
I JUNIOR HIGH SCHOOL (Grades 7, 8, &9)	1. Orientation 2. Exploration	•Insights into Industry and Technology •Graphic Communications Technology •Manufacturing Technology •Construction Technology •Energy/Power Technology

PROGRAM STANDARDS FOR INDUSTRIAL ARTS

ELEMENTS OF QUALITY INDUSTRIAL ARTS PROGRAMS

The success and quality of programs in industrial arts education depends upon elements that influence the quality of programs. Industrial arts must be responsive to the following elements:

A. GOALS AND OBJECTIVES: Program goals and objectives are established that provide the inspiration and guidance in program development, operation and evaluation.

B. INSTRUCTIONAL STAFF: The instructional staff is competent and meet necessary qualifications.

C. INSTRUCTIONAL PLAN: Selected subject matter is appropriate to learner's level and consistent with curriculum and course goals and objectives.

D. STUDENT ORGANIZATIONS: The establishment and operation of effective student organizations.

E. FACILITIES AND EQUIPMENT: Instructional facilities are well-designed, located and supportive of accomplishing curricular goals. (Refer to Educational Specifications for Industrial Arts Instructional Facilities Handbook, 1978.)

F. SPECIAL NEEDS: The program must provide for disadvantaged and handicapped students.

G. ADVISORY COMMITTEES: The establishment and effective use of industrial arts advisory committees.

H. GUIDANCE: The teacher's role in guidance.

I. ADMINISTRATION: Administration of the industrial arts program.

J. EVALUATION: Evaluation procedures are planned and implemented to assure continual program improvement.

NOTE: For further information on program standards, refer to the NORTH DAKOTA VOCATIONAL / TECHNICAL EDUCATION PROGRAM STANDARDS, Section 11.1 to 11.7.

INDUSTRIAL ARTS COURSE CODE NUMBERS
(Vocationally Funded)

Insights Into Industry and Technology	10001
Construction Technology	10011
Manufacturing Technology	10021
Wood Technology	10023
Metal Technology	10026
Plastic Technology	10029
Energy and Power Technology	10031
Electrical/Electronic Technology	10033
Energy Sources	10038
Power Technology	10039
Graphic Communications Technology	10051
Graphic Arts	10052
Design/Drafting	10053
Photography	10054
Construction Drafting	10056
Transportation	10061
Industrial Crafts	10080
Individual Technical Problems	10091
Individual Technical Problems	10092

PART II:

CONSTRUCTION DRAFTING COURSE GUIDE

(# 10056)

CONSTRUCTION DRAFTING

Rationale:

A study of construction drafting within graphic communications provides an opportunity for a concentrated and specialized study of drafting in the construction industry. An atmosphere is provided for all students to develop pre-technical skills and knowledge in the economic, social and technological aspects of visual communications in a changing society. Construction drafting involves students in meaningful instructional activities and develops self direction, continuous learning and creativity.

Course Objectives:

(1) This course will provide the student with instruction in design and preparation of plans for residential construction.

(2) This course will provide the student with instruction in interpreting plans and their importance to construction.

(3) The course will provide the student with information related to career opportunities within the construction drafting industry.

Guidelines For Implementation

Success in the classroom or laboratory depends on many factors. Foremost among these is the planning effort on the part of the teacher. Educational programs must be flexible and adaptable. They must be flexible enough to remain adaptable to all locales, in numerous types of facilities, and with students possessing differing values and interest. Therefore, a successful program must be capable of application in both small and large schools.

The industrial arts program recommended by these course guides are designed to meet individual student needs. They provide teachers with guidelines for a well balanced program with suggested teacher options in each of the three major technical study areas: (1) Graphic Communications; (2) Energy/Power; and (3) Production. The North Dakota secondary school industrial arts program suggests three levels of learning with an alternative curriculum approach at the Level II for those schools that cannot offer specific courses identified for each of the three technical study area due to the size of enrollments or other limiting factors.

The recommended scope and sequence of course offerings for the graphic communications technical study area is illustrated on the sample program model on page 13. The Level I course serves as an orientation and exploratory learning experience and is recommended as a prerequisite to the four specific courses listed at Level II. The senior high Level II courses provide concentrated and indepth exploratory experiences in the four major components involved in Graphic Communications: (1) Design/Drafting; (2) Graphic Arts; (3) Construction Drafting; and (4) Photography. Since students at this level display a wide range of interests, abilities, and life goals, the industrial arts program must provide a variety of learning and course options to meet individual student needs. To meet the varied student needs, it is recommended that the specific course options be made available to students when possible. For the smaller and mid-sized schools, it may not be feasible to offer all four of the specific courses identified for Level II. If that should be the case, it is recommended that one or two of the courses be offered and an ITP (Individual Technical Problems) course be offered as a Level II alternative. (See ITP Course specifications on page 14). This course is designed to provide multiple learning experiences in graphic communications to meet individual needs.

The Level III ITP Course (Code #10092) is suggested for student in larger programs who have had the Level II indepth exploratory courses in graphic communications and desire to study a specialized aspect related to design/drafting, graphic arts, construction drafting, and/or photography. (See pages 15 and 16 for specific Level III ITP Course specifications and technical problem options).

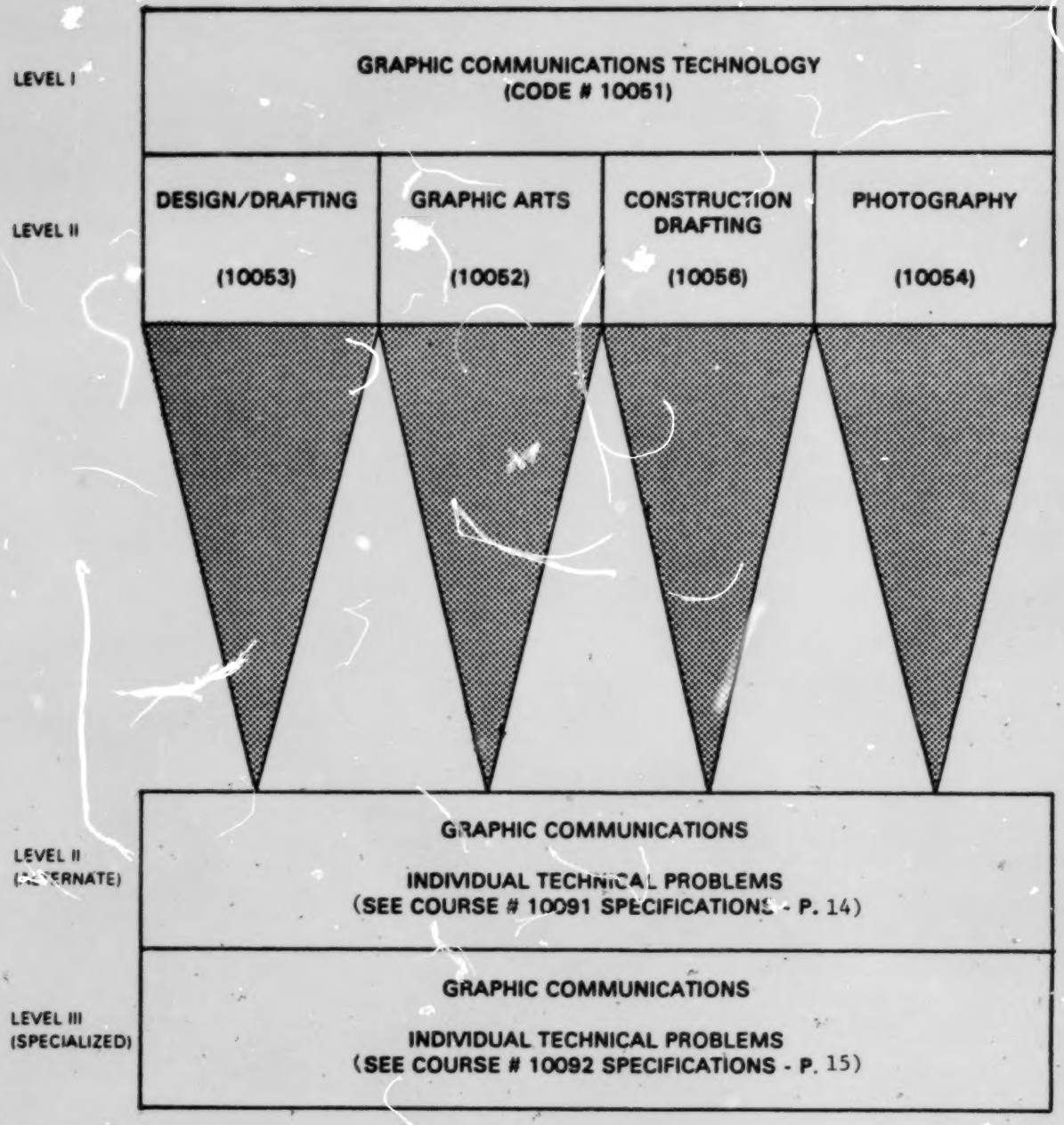
Guidelines For Implementing the Construction Drafting Course

This Instructional Guide is designed to assist teachers, supervisors, administrators, and teacher-educators as they organize an industrial arts course in construction drafting within graphic communications in the State of North Dakota.

This guide will provide the instructor with suggested procedures, learning activities, and course resources to assist in setting up a program which corresponds to the students needs. It is a fact, the school day is limited in time and it is difficult to locate and acquire the vast amount of available materials. However, the instructor in this field will choose those concepts most applicable to his or her school.

It is recommended that the student acquires graphic communications, Level I, and Design/Drafting as pre-requisites to this course.

Texts indicated in this guide, are used only as examples. The instructor may select the text which is applicable to his or her needs.



Sample Program Model

INDIVIDUAL TECHNICAL PROBLEMS

COURSE CODE: 10091

This individual technical problem course is designed for students who have not had the opportunity to enroll in specific Level II subject matter courses in the Graphic Communications Technology cluster area. The course is designed to provide a means for meeting individual student needs through the offering of multiple activities in a number of technical areas in schools where separate courses are not available.

INDUSTRIAL ARTS PURPOSE

Personal Enrichment

Pre-Technical

GRADE LEVEL

11 - 12

COURSE LENGTH

One period per day

18 or 36 weeks

UNIT OF CREDIT

½ or 1 unit

RECOMMENDED PREREQUISITES

Level I Curriculum Courses

SELECTED STUDENT COMPETENCIES

NOTE: Individual student competencies and learning experiences are to be identified and developed on a contractual basis by the student and approved by the instructor for each problem.

SAMPLE LEARNING TOPICS

NOTE: Learning topics for the ITP are to be selected from the instructional units identified for each specific subject matter course. These courses include:

GRAPHIC COMMUNICATIONS:

-- Design/Drafting, 10053
-- Photography, 10054
-- Graphic Arts, 10052
-- Construction Drafting, 10056

INDIVIDUAL TECHNICAL PROBLEMS: GRAPHIC COMMUNICATIONS

COURSE CODE: 10092

This individual technical problem course is designed for students who have had the Level II preliminary courses of this cluster in the chosen area of study and intend to study specific advanced information and techniques in design/drafting, photography, graphic arts, and/or construction drafting.

INDUSTRIAL ARTS PURPOSE

Personal Enrichment

Pre-Technical

GRADE LEVEL

11 - 12

COURSE LENGTH

One period per day

18 or 36 weeks

UNIT OF CREDIT

½ or 1 unit

RECOMMENDED PREREQUISITES

See Course Description

Instruction in this industrial arts course is open to meet students needs. The following suggested objectives are meant to provide ideas for developing the student's program.

1. To prepare for seeking advanced education in the area of graphic communications.
2. To provide students the experiences in problem-solving, research and development with regard to any specific chosen means in graphic communications.
3. To provide students information regarding industrial materials, processes and the practical applications of scientific principles.
4. To provide students an understanding of industry, its place in society, and the free enterprise system.
5. To provide students an understanding in related career opportunities in graphic communications.

10092
COURSE CODE

INDIVIDUAL TECHNICAL PROBLEMS: GRAPHIC COMMUNICATIONS

SAMPLE LEARNING TOPICS

DESIGN/DRAFTING:
Design/drafting as pertains to:

I. Aerospace Engineering
II. Civil Engineering
III. Electrical/Electronic Engineering
IV. Geological Enginering
V. Mechanical Engineering
VI. Marine Engineering
VII. Nuclear Engineering
VIII. Production Industry

PHOTOGRAPHY:

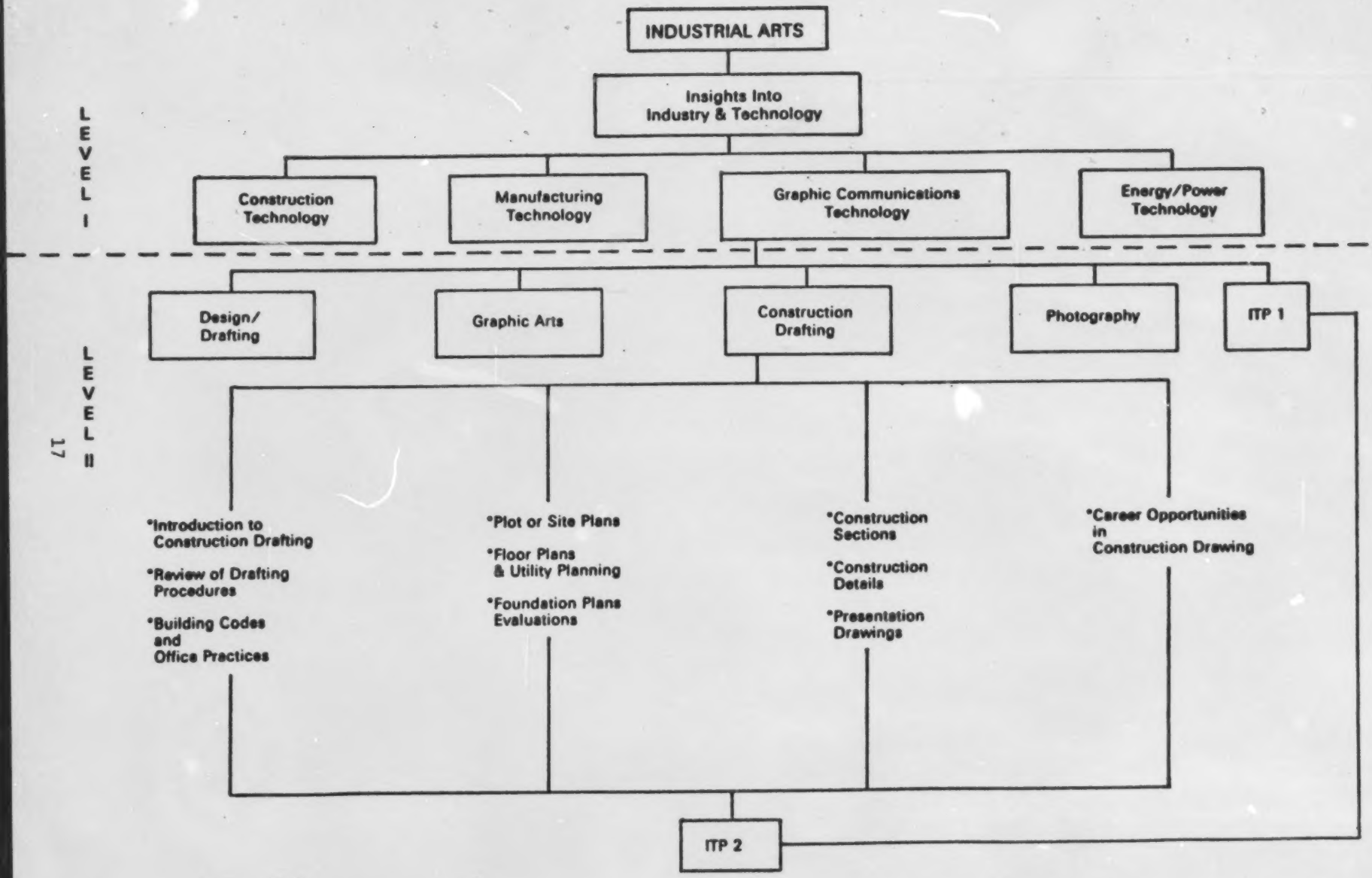
I. Photography Education
II. Basic Sensitometry
III. Characteristics and Applications of Various Photographic Materials
IV. Basic Scientific Photography
V. Portrait Photography
VI. Color Theory and Color Photography
VII. Safety and Health Hazards with Photographic Chemicals
VIII. Career Opportunities in Photography Related Industry

GRAPHIC ARTS:

I. Photo-Offset Process
II. Advanced Screen Printing Techniques
III. Color Separation and Reproduction
IV. Reproduction Techniques for Audio-Visual Materials
V. Modern Image Generation Methods
VI. Special Effect Reproduction
VII. Advanced Layout and Design
VIII. Market and Cost Analysis

CONSTRUCTION DRAFTING:

I. Advanced Construction Drafting Education
II. Planning and Design Considerations
III. Resource Materials for Construction Drafting
IV. Color Illustrations and Presentation Drawings
V. Architectural Model Making
VI. Landscaping Design
VII. Interior Design


INDUSTRIAL ARTS
Insights Into Industry & Technology
LEVEL I
Construction Technology
Manufacturing Technology
Graphic Communications Technology
Energy/Power Technology
LEVEL II
Design/ Drafting
Graphic Arts
Construction Drafting
Photography
ITP 1
*Introduction to Construction Drafting
*Review of Drafting Procedures
*Building Codes and Office Practices
*Plot or Site Plans
*Floor Plans & Utility Planning
*Foundation Plans Evaluations
*Construction Sections
*Construction Details
*Presentation Drawings
*Career Opportunities in Construction Drawing
ITP 2

CONSTRUCTION DRAFTING

COURSE CODE: 10056

This course is designed to provide students with the necessary theory and techniques to read blueprints and produce working drawings in the area of residential construction.

INDUSTRIAL ARTS PURPOSE

Personal Enrichment

Pre-Technical

GRADE LEVEL

10 - 12

COURSE LENGTH

One period per day

18 weeks

UNIT OF CREDIT

½ unit

RECOMMENDED PREREQUISITES

Graphic Communications Technology, 10051 and Design/Drafting, 10053.

SELECTED STUDENT COMPETENCIES

Experiences and activities of this industrial arts course will enable the student to:

1. Identify the need for a complete set of drawings in relation to construction.
2. Realize the importance of legible, well prepared drawings.
3. Discuss the details related to residential construction.
4. Become familiar with the properties, functions, and sizes of various building materials.
5. Acquire a working knowledge of residential designs.
6. Identify the differences among sections, plans, and elevations.
7. Demonstrate the ability of proper dimensioning practices.
8. Discuss and use building codes and specifications.
9. Produce a complete set of proper, well executed residential construction drawings.

10056
Course Code

CONSTRUCTION DRAFTING

Suggested Instructional Units

		Class Periods (18 wks) (36 wks)
I.	Introduction to Construction Drafting	1
II.	Review of Drafting Procedures	4
III.	Building Codes and Office Practices Used	1
IV.	Plot or Site Plans	9
V.	Floor Plans and Utility Planning	15
VI.	Foundation Plans	10
VII.	Elevations	15
VIII.	Construction Sections	10
IX.	Construction Details	10
X.	Presentation Drawings	10
XI.	Career Opportunities in Construction Drawing	2
	Catch Up	3
	TOTAL	90

UNIT I

Introduction to Construction Drafting

OBJECTIVES:

This unit is meant to provide the student with:

1. An appreciation and understanding of the part drafting and design plays in the development of a residence

2. A respect for the many areas of skill required to complete a residence

1.0.0 Residential Planning

- 1.1.0 Owners or occupants
- 1.2.0 Designer
- 1.3.0 Draftsman
- 1.4.0 Material suppliers
- 1.5.0 Builders or contractors
  - 1.5.1 Masons
  - 1.5.2 Concrete workers
  - 1.5.3 Carpenters
  - 1.5.4 Electricians
  - 1.5.5 Plumbers
  - 1.5.6 Iron Workers
  - 1.5.7 Painters, decorators & interior finishers
  - 1.5.8 Landscape & nursery people
  - 1.5.9 Sheet metal workers
  - 1.5.10 Heating contractors
  - 1.5.11 Excavators
- 1.6.0 City & urban planners
- 1.7.0 Loan agencies

SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR

Construction Drafting

UNIT I: Introduction to Construction Drafting

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Identify and narrate the contribution drafting and design make in the development and construction of a residence	A.1 The student will participate in a field trip, the primary purpose of which will be to obtain an overview of the entire home construction operation, with specific reference to the role of the draftsman
B. Identify the skills and types of workers required to complete a residence	B.1 Participate in class discussion revolving around all the skills and types of labor required in house construction B.2 Interview at least one person involved in some phase of house construction and participate in a classroom sharing discussion relating to the interview

UNIT II

Review of Drafting Procedures

OBJECTIVES:

This unit is meant to provide the student with:

1. A review of drafting procedures and practices covered in design/drafting
2. Architectural practices that are variations from design/drafting procedures
3. Experience in Architectural lettering

1.0.0 General Drafting Practices & Procedures

1.1.0 Architectural line symbols

1.1.1 Border
1.1.2 Object
1.1.3 Cutting plane
1.1.4 Short break
1.1.5 Hidden
1.1.6 Center
1.1.7 Section
1.1.8 Dimension

1.1.8.1 Styles of terminating dimensioning lines

1.1.9 Long break
1.1.10 Leaders

1.2.0 Architectural lettering

1.2.1 Various sample styles
1.2.2 Developing a style of your own

1.2.2.1 Artistic but readily identifiable
1.2.2.2 Lower case letters seldom used
1.2.2.3 Practice your style

1.2.3 Lettering aids

1.2.3.1 Press on
1.2.3.2 Machines & guides

1.3.0 Architectural material symbols

1.3.1 Concrete
1.3.2 Brick

1.3.3 Stone
1.3.4 Wood
1.3.5 Tile
1.3.6 Glass
1.3.7 Steel
1.3.8 Insulation
1.3.9 Plaster
1.3.10 Terrazo

SELECTED STUDENT COMPETENCIES AND SAMPLE LEARNING ACTIVITIES FOR

Construction Drafting

UNIT II: Review of Drafting Procedures

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Perform in the drafting room using all equipment, supplies, aids, and materials	A.1 Participate in class activities and assignments
	A.2 Produce assigned work at an acceptable level
B. Identify the differences and similarities between architectural and technical lettering practices	B.1 Complete an assignment involving experimentation with architectural lettering
	B.2 View samples of various architectural lettering
	B.3 Collect at least three samples of architectural lettering
C. Construct and identify lines used in architectural drawings	C.1 Complete an alphabet of architectual lines
D. Identify material symbols used in architectural plans and sections	D.1 Complete sample architectural materials symbols

UNIT III

Building Codes and Office Practices Used

OBJECTIVES:

This unit is meant to provide the student with:

1. A familiarization with building codes
2. The general manner in which an architectural office operates
3. The function of a draftsman in a construction business
4. Aids and data available to construction design & drafting

1.0.0 Building Codes

- 1.1.0 Restrictions & ordinances
- 1.2.0 Zoning

2.0.0 Office Practices

- 2.1.0 Design costs
- 2.2.0 Titles & deeds
- 2.3.0 Plan development

SELECTED STUDENT COMPETENCIES AND SAMPLE LEARNING ACTIVITIES FOR

Construction Drafting

UNIT III: Building Codes and Office Practices Used

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Display an awareness of building codes and the effect they have on construction and design	A.1 Participate in a class discussion led by a city planner, engineer, architect or building contractor
	A.2 Participate in a class review of printed building codes pertaining to his or her city
B. Identify and evaluate the types of equipment and materials used in the construction drafting industry	B.1 Participate in a field trip to a construction drafting office, the primary purpose of which will be to obtain an overview of what is involved in drafting for construction

UNIT IV

Plot or Site Plans

OBJECTIVES:

This unit is meant to provide the student with:

1. A knowledge of items to consider in choosing a lot or site for a residence
2. A basic understanding of how much a lot should cost
3. Information on what deed and title are in relation to residence construction

1.0.0 Physical Features of Lots

- 1.1.0 Topography
- 1.2.0 Soil conditions

2.0.0 Lot Size

- 2.1.0 Public
- 2.2.0 Private
- 2.3.0 Utility

3.0.0 Site Cost

4.0.0 Community Considerations

- 4.1.0 Neighborhood
- 4.2.0 Zoning
- 4.3.0 Improvements
  - 4.3.1 Paving
  - 4.3.2 Lighting
  - 4.3.3 Sidewalks
- 4.4.0 Traffic
- 4.5.0 Access to facilities
  - 4.5.1 Schools
  - 4.5.2 City
  - 4.5.3 Churches
  - 4.5.4 Hospitals

4.6.0 Buying a lot

4.6.1 Title
4.6.2 Deed

5.0.0 Solar Orientation of House on Lot

5.1.0 Wind

5.2.0 Sun

6.0.0 Drawing the Plot Plan

6.1.0 Lines & symbols

6.2.0 Dimensioning

SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR

Construction Drafting

UNIT IV: Plot or Site Plans

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Recognize and compare basic considerations in choosing a building site for a house	A.1 Participate in a class discussion revolving around seeking and selecting a lot or building site for a residence A.2 Assist in identifying principles of good and bad aspects of various sample building lots or sites
B. Complete an acceptable, easily read plot plan for a residence situation	B.1 Develop a working drawing for an original design, the degree of completeness to be determined by the complexity and type of building site chosen

UNIT V

Floor Plans & Utility Planning

OBJECTIVES:

This unit is meant to provide the student with:

1. Basic floor planning principles
2. Floor plan evaluation skills
3. The ability to draw a legible floor plan

1.0.0 Planning the Sleeping Area

- 1.1.0 Solar orientation
- 1.2.0 Relation to other zones of house
- 1.3.0 Relation to baths and storage

2.0.0 Planning the Living Area

- 2.1.0 Living room, dining room, recreation or family room, den, music, sewing & other special purpose rooms
- 2.2.0 Relation to outside living
- 2.3.0 Traffic patterns
- 2.4.0 Location of fireplaces, windows, doors, storage, and hallways

3.0.0 Planning the Utility Area

- 3.1.0 Accessability from outside
- 3.2.0 Relation to other areas
- 3.3.0 Solar orientation

4.0.0 Planning the Solar Orientation of Entire Plan

- 4.1.0 Wind considerations
- 4.2.0 Sun considerations

5.0.0 Drawing the Floor Plan

UNIT V

5.1.0 Windows

5.2.0 Doors

5.3.0 Walls & partitions

5.4.0 Dimensioning

SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR

Construction Drafting

UNIT V: Floor Plans & Utility Planning

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Recognize good and bad design features in a residence floor plan	A.1 Collect floor plans from magazines, newspapers, building literature and possibly the building industry
	A.2 Participate in class evaluation of various floor plans
B. Demonstrate proficiency in expressing ideas through graphic representation techniques	B.1 Develop a complete floor plan for an original design, the degree of completeness will be determined by the complexity of the problem
C. Interpret floor plans completed by draftsmen in industry	C.1 Collect floor plans from industry and participate in complete interpretation of drawings in the classroom
	C.2 Assist in reading or interpreting floor plans completed by other class members

UNIT VI

Foundation Plans

OBJECTIVES:

This unit is meant to provide the student with:

1. An understanding of the principles of supporting houses with various types of foundations
2. An introduction to different materials used in constructing foundations
3. An ability to complete a legible foundation plan

1.0.0 Basic Foundation Types

- 1.1.0 "T"
- 1.2.0 Slab
- 1.3.0 Post or pier

2.0.0 Foundation Depths

- 2.1.0 Soil conditions
- 2.2.0 Frost depths

3.0.0 Patio, Steps, Garage & Detached Foundations

4.0.0 Wall, Floor & Footing Sizes

- 4.1.0 Reinforcing

5.0.0 House Weight Calculations

6.0.0 Drawing the Foundation Plan

- 6.1.0 Windows
- 6.2.0 Doors
- 6.3.0 Walls & footings
- 6.4.0 Areaways & windowalls
- 6.5.0 Excavations
- 6.6.0 Dimensioning
- 6.7.0 Joist framing pattern & support

SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR

Construction Drafting

UNIT VI: Foundation Plans

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Recognize the principles of good design in residential foundations	A.1 Produce acceptable sections and details for various examples of foundation construction
	A.2 Collect samples of foundation plans representing slab, "T", and post or pier support
B. Exhibit proficiency in developing ideas through drafting techniques	B.1 Produce a complete foundation plan for a residence requiring slabs, beams, footing, step foundations and attached garage
C. Identify the materials and components used in supporting foundations for houses	C.1 Participate in classroom discussion demonstration and viewing visual aids with reference to residence foundations

UNIT VII

Elevations

OBJECTIVES:

This unit is meant to provide the student with:

1. A knowledge of various materials used as exterior finishes on houses
2. A working understanding of arriving at various elevations of house components
3. Some appreciation for exterior design and style
4. The ability to complete an elevation of a house

1.0.0 Elevation Measurements of House Components

- 1.1.0 Foundation
  - 1.1.1 Grade line
  - 1.1.2 Footings
  - 1.1.3 Basement floor to ceiling
- 1.2.0 Floor to ceiling height of various floors
- 1.3.0 Door and window location
- 1.4.0 Roof and overhang location
  - 1.4.1 Roof pitch
  - 1.4.2 Roof intersections
  - 1.4.3 Facia and rooftrim
  - 1.4.4 Chimneys
- 1.5.0 Height of decks, railings, steps, garage door and various other details

2.0.0 Materials Used as Exterior Finishes on Houses

- 2.1.0 Wall finishes
  - 2.1.1 Wood siding
  - 2.1.2 Composition siding
  - 2.1.3 Metal siding
  - 2.1.4 Masonry & wall finishes
  - 2.1.5 Plaster & stucco finishes
- 2.2.0 Roof finishes

2.2.1 Composition shingles
2.2.2 Wood shingles
2.2.3 Metal roof coverings
2.2.4 Built up roofing
2.2.5 Tile, asbestos & slate roofing

2.3.0 Trim and overhang finishes

2.3.1 Wood
2.3.2 Plastic
2.3.3 Metal

3.0.0 Material Symbols, Proportions and Line Weights

3.1.0 Layout, major & minor lines

3.2.0 Proportions and sizes

3.2.1 Bricks
3.2.2 Concrete blocks
3.2.3 Shingles & roof coverings
3.2.4 Window & door trim
3.2.5 Vents & louvers
3.2.6 Areaways

3.3.0 Material symbols for exterior finish materials

4.0.0 Methods of Developing an Elevation

4.1.0 Wall section, ¼" = 1'-0

4.2.0 Floor plan, ¼" = 1'-0

4.3.0 Method of developing orthographic views or elevations

4.3.1 Locations from floor plans
4.3.2 Elevations from section

5.0.0 Roof Design and Its Effect on Style

5.1.0 Roof types

SELECTED STUDENT COMPETENCIES AND SAMPLE LEARNING ACTIVITIES FOR

Construction Drafting

UNIT VII: Elevations

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Define the major elevation measurements and how to calculate them for use in developing an elevation drawing	A.1 View an illustrating method of arriving at the height for elevation drawing A.2 Study sample elevations of various wall sections containing different styles and exterior finish materials
B. Identify the major types of materials and supplies used in finishing the exteriors of houses	B.1 Use reference and resource materials available in the drafting room to complete plans for exterior finish
C. Exhibit proficiency in completing elevation drawing	C.1 Develop complete elevation drawings of front, right, left and rear views of a residence

UNIT VIII

Construction Sections

OBJECTIVES:

This unit is meant to provide the student with:

1. An understanding of the purpose for construction sections
2. A respect for accuracy and neatness in preparing sections
3. An opportunity to develop complete section drawings

1.0.0 Purpose of Sections

2.0.0 Developing Section Drawings

- 2.1.0 Scale
- 2.2.0 Material symbols
- 2.3.0 Line weight & layout
- 2.4.0 Lettering

3.0.0 Types of Sections

- 3.1.0 Typical wall
- 3.2.0 Overhang or cornice
- 3.3.0 Detail
- 3.4.0 Full section

SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR

Construction Drafting

UNIT VIII: Construction Sections

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Analyze and explain the role of sections in a set of working plans	A.1 Complete sample section drawings relating to various areas of house construction A.2 Participate in collecting and interpreting sections taken from plans in industry
B. Exhibit proficiency in illustrating ideas using good drafting room procedures	B.1 Complete section drawings illustrating construction techniques required in completing a phase of developing part of a residence of the students own design
C. Illustrate materials in sections with symbols for different building materials	C.1 Participate in a review of material symbols and how they relate to section drawings

UNIT IX

Construction Details

OBJECTIVES:

This unit is meant to provide the student with:

1. An understanding of the purpose for construction details
2. An opportunity to develop the ability to complete construction details

1.0.0 Introduction to Construction Details

- 1.1.0 What are construction details
- 1.2.0 Need for construction details

2.0.0 Development of Construction Details

- 2.1.0 Types
  - 2.1.1 Elevations
  - 2.1.2 Sections
  - 2.1.3 Isometrics
  - 2.1.4 Orthographics
- 2.2.0 Scale & layout
  - 2.2.1 Scale choice
  - 2.2.2 Notes & lettering
  - 2.2.3 General layout
  - 2.2.4 Reference

SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR

Construction Drafting

UNIT IX: Construction Details

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Identify the need for construction details in a set of working plans	A.1 Participate in a classroom discussion pertaining to purpose and value of detail drawings
	A.2 Assist in a classroom assignment related to identifying needs for details in particular plans
B. Exhibit proficiency in expressing ideas in details through good drafting room techniques	B.1 Develop detail drawings for areas determined by the student as necessary for complete working plans
C. Interpret detail drawings in construction plans	C.1 Participate in class collection and interpretation of detail drawings used in the construction industry

UNIT X

Presentation Drawings

OBJECTIVES:

This unit is meant to provide the student with:

1. The purpose of presentation drawings
2. An understanding of the principles of perspective drawing
3. An appreciation for good technique in preparation of presentation drawings

1.0.0 Introduction to Presentation Drawings

- 1.1.0 What is a presentation drawing
- 1.2.0 Purpose of a presentation drawing
- 1.3.0 Types of presentation drawings
  - 1.3.1 1 point perspective
  - 1.3.2 2 point perspective
  - 1.3.3 Orthographic
  - 1.3.4 Sketch
  - 1.3.5 Isometric

2.0.0 Review of Perspective Drawing

- 2.1.0 1 point
- 2.2.0 2 point
- 2.3.0 Interior
- 2.4.0 Exterior
- 2.5.0 General set up
  - 2.5.1 Picture plane
  - 2.5.2 Station point
  - 2.5.3 Vanishing point
  - 2.5.4 Horizon line
- 2.6.0 Developing the presentation drawing
  - 2.6.1 Line development
  - 2.6.2 Color

2.6.2.1 Colored pencils
2.6.2.2 Colored ink
2.6.2.3 Colored chalk
2.6.2.4 Water colors

2.7.0 Trees & landscape

2.7.1 General types
2.7.2 Position
2.7.3 Purpose in presentation

SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR

Construction Drafting

UNIT X: Presentation Drawings

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Recognize the purpose and need for presentation drawings in developing a complete set of plans	A.1 View several presentation drawings the primary purpose of which will be to obtain an overview of the effect presentation drawings have in presenting the whole idea or concept
B. Possess a working knowledge of the principles of perspective drawing	B.1 View and participate in a chalkboard demonstration of perspective principles B.2 Complete practice assignments involving basic 1 & 2 point perspective problems
C. Exhibit proficiency in developing in a perspective presentation drawing	C.1 Develop a presentation drawing of a house using 2 point perspective principles, including landscape and color

UNIT XI

Career Opportunities in Construction Drawing

OBJECTIVES:

This unit is meant to provide the student with:

1. A knowledge of opportunities related to construction drawing
2. An appreciation for jobs and careers related to the construction field

1.0.0 Introduction to Career Opportunities Involving Drafting in Construction

- 1.1.0 Architecture
- 1.2.0 Landscape architecture
- 1.3.0 Urban or city planner
- 1.4.0 Interior decorator
- 1.5.0 Commercial artist
- 1.6.0 Draftsman
- 1.7.0 Surveyor
- 1.8.0 Industrial arts teacher

2.0.0 Construction Trades Related to Drafting

- 2.1.0 Carpenters
- 2.2.0 Bricklayers
- 2.3.0 Stone masons
- 2.4.0 Cement masons
- 2.5.0 Iron workers
- 2.6.0 Operating engineers
- 2.7.0 Lathers
- 2.8.0 Plasterers

UNIT XI

2.9.0 Marble tile & terrazo workers

2.10.0 Floor covering installers

2.11.0 Painters & decorators

2.12.0 Roofers

SELECTED STUDENT COMPETENCIES
AND SAMPLE LEARNING ACTIVITIES
FOR

Construction Drafting

UNIT XI: Career Opportunities in Construction Drawing

SELECTED STUDENT COMPETENCIES	SAMPLE LEARNING ACTIVITIES
THE LEARNING ACTIVITIES SHOULD ENABLE THE STUDENT TO:	
A. Formulate positive opinions regarding occupations in the construction drafting area	A.1 Write a short paper dealing with occupations and opportunities in the construction drafting field
	A.2 Participate in a classroom discussion involving job opportunities and introduction to various skilled workers related to construction and drafting
B. Generate a positive attitude toward drafting equipment operation	B.1 Demonstrate the use of at least one piece of equipment or instrument used in the drafting room
C. Exhibit a willingness to discuss technical aspects of construction with other students	C.1 Prepare a short explanation of some phase of construction to be presented to another student

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